Amendments to the Specification:

Please replace the second full paragraph on page 2, with the following rewritten paragraph:

The purpose of the invention is to perfect such methods by combining numerous results, and it comprises improving the result selection criteria. More precisely, in its most general form it relates to a method for radiological examination of an object in which at least two categories of materials are taken into consideration, comprising: the use of broad spectrum x-rays; measurements of the x-rays by bands of the spectrum; expressions *(~~M?~~$\underline{\hat{M}}$)* of thicknesses or masses of the two categories of materials passed through by the x-rays, the expressions *(~~M?~~$\underline{\hat{M}}$)* being functions of at least two of the measurements (mes_k) and coefficient (A); and applying a selection criterion from among the expressions *(~~M?~~$\underline{\hat{M}}$)* to deduce from it an expression *(final ~~M?~~$\underline{\hat{M}}$)* considered true; characterized in that the selection criterion comprises a combination (f) of the expressions with weighting factors (a), and a calculation of weighting factors such that the combination has minimal noise (minimal variance in mathematical language) calculated according to the noise levels on the measurements (variance on the measurements).

Please replace the second full paragraph on page 3, beginning with "The attenuation of the x-rays" with the following rewritten paragraph:

The attenuation of the x-rays can be expressed as a function of the thicknesses passed through for each of the

materials of indicators x and y, or of their masses M (density per surface unit) in the direction of the x-rays. The spectrum of measurements in Fig. 1 is divided into N bands generally marked by indicators i and j. The attenuations will vary in each of the bands according to variable absorption coefficients for the two materials. If we call mes_i or mes_j the measurements for a band of energy i or j, the masses passed through M_x and M_y can each also be expressed by the general formula

$$\cancel{(M?) = A_1 + A_2 \cdot mes_i + A_3 \cdot mes_j + A_4 \cdot mes^2, + A_5 \cdot mes^2, + A_6 \cdot mes_j \cdot mes_j}$$

$$\underline{(\hat{M}) = A_1 + A_2 \cdot mes_i + A_3 \cdot mes_j + A_4 \cdot mes_i^2, + A_5 \cdot mes_j^2, + A_6 \cdot mes_i \cdot mes_j}$$

The measurements considered in this example being attenuation measurements, we will have for each measurement channel i (corresponding to a band of the spectrum) the relation $mes_i = \ln (noi/ni)$ where noi is the number of photons arriving on the object and ni the number of photons having passed through the object. Since the non-linearity of the functions M_x and M_y as a function of the measurements is slight in practical reality, one can make use of this second degree polynomial function that comprises six coefficients A_1 through A_6. The degree of the polynomial can be adjusted depending on the problem. For example, to analyze objects made of materials having atomic numbers higher than that of biological tissue, as in non-destructive monitoring for examining a metal object, the measurements considered in this example being attenuation measurements, we will have for each measurement channel i (corresponding to a band of the spectrum) the relation $mes_i = \ln (noi/ni)$ where noi is the number of photons

arriving on the object and ni the number of photons having passed through the object.

Please replace the second full paragraph on page 4, with the following rewritten paragraph:

A preferred method consists of ~~selling~~ choosing in the beginning the band of measurements with the least noise (for example the one that has the greatest signal n - number of photons at reception) and successively combining it with each of the other bands of measurements for the combinations. One finally obtains (N-1) estimates of the two functions M_x and M_y, which are noted ~~M_1?~~ $\underline{\hat{M}_1}$, ~~M_2?~~ $\underline{\hat{M}_2}$, ..., ~~M?N-1~~ $\underline{\hat{M}_{N-1}}$ for each of these two functions.

Please replace the last full paragraph on page 4, with the following rewritten paragraph:

Since there is no reason to prefer either of these ~~M?~~ $\underline{\hat{M}}$ estimates, a selection criterion must be applied to obtain the final ~~M?~~ $\underline{\hat{M}}$ estimate that will be considered true. In the previous article, one of the expressions obtained was directly selected according to a criterion of classification (the mean result) or median of the values considered by the expressions for one of the results. In the invention, the ~~M?~~ $\underline{\hat{M}}$ expressions will be combined; e.g. linearly according to the final ~~M?~~ $\underline{\hat{M}}$ formula = (a1 ~~M?~~ $\underline{\hat{M}}$ 1) + (a2 ~~M?~~ $\underline{\hat{M}}$ 2) +...+ (a N-1 ~~M?~~ $\underline{\hat{M}}$ N -1) while minimizing the

noise; the coefficients a_1, etc. have a sum equal to the unit

~~(a1 + a2 + ... + a N-1 = 1)~~ (a1 + a2 + ... + aN-1 = 1).

Please replace the first equation on page 5 which is as follows:

$$\Gamma_y = \sum_{k=1}^{N-1} \frac{\partial M?_1 \quad \partial M?_f \quad 1}{\partial mes_k \quad \partial mes_k \quad N_k}$$

with the following replacement equation:

$$\Gamma_{ij} = \sum_{k=1}^{N-1} \frac{\partial \hat{M}_i}{mes_k} \bullet \frac{\partial \hat{M}_j}{mes_k} \bullet \frac{1}{N_k}$$

Please replace the paragraph following the above equation with:

The variance on the linear combination yielding final ~~M?~~ $\hat{M}$ is expressed by the formula:

$$f = (a_1, \ldots, a_{N-1}) \cdot \Gamma \cdot {}^t(a_1, \ldots, a_{N-1});$$

this quantity f attains an optimal value when its derivative according to all of the variables is null, that is, the noise's influence is minimized, i.e.,

$$\left\{ \begin{array}{l} \partial f/\partial a_1 = 0 \\ \partial f/\partial a_2 = 0 \\ \ldots \\ \partial f/\partial a_{N-1} = 0 \end{array} \right.$$

Please replace the second paragraph on page 5, with the following rewritten paragraph:

The numerical resolution of this system provides the coefficients a1, a2, etc. N final ~~M?~~ $\hat{M}$, that is, the masses passed through in the two categories of materials.

Please replace the last paragraph on page 5 continuing on page 6, with the following rewritten paragraph:

These are the operations completed in the invention; it should be noted that the measurements (mes_x) used in the formula yielding ~~F_y~~ Γ_{ij} and so forth are the measurements carried out through the actual object to be analyzed, but not those that were made by calibration to determine the coefficients A of the functions ~~M?~~ $\hat{M}$.

Please replace the last paragraph on page 6, with the following rewritten paragraph:

Lastly, the invention can be broadened to a greater number of materials than two, which can be advantageous in particular for imaging processes with contrast products, where three variables must be considered or for checking baggage (searching for explosives); and it can be applied when considering combinations of the ~~M?~~ $\hat{M}$ functions other than linear ones,

Applications of the invention are:

- osteodensitometry

- obtaining the density of bone mass

- obtaining body composition (fat mass, lean mass)

- food-processing inspection, e.g. detecting bone fragments in meat or detecting pieces of glass in meals being served,

- baggage inspection; searching for explosives, illegal products (weapons, food, drugs,...).